

Increase Flexibility in the Terminal Environment

Summary Description:

Increase Flexibility in the Terminal Environment solution set covers the terminal and airport operations ability to meet the need of both high-density terminals and other airports. Flexible terminal solutions focus on improvements to the management of separation at all airports. Such capabilities will improve safety, efficiency and maintain capacity in reduced visibility high-density terminal operations. Flexible terminal solutions will also improve trajectory management and advanced separation procedures employed when demand warrants. At airports where traffic demand is lower, and at high-density airports during times of low demand, operations requiring lesser aircraft capability are conducted, allowing access to a wider range of operators while retaining the throughput and efficiency advantages of high-density operations. Both trajectory and non trajectory-based operations may be conducted within flexible terminal operations. The activities do not rise to a level which requires flow management or flow tools.

Background:

Flexible terminal operations are a mix of IFR/VFR traffic with aircraft types ranging from airline transport to low-end general aviation. Airports in these areas are towered and non-towered, depending on traffic demand. In the future, some satellite airports will experience higher traffic demand due to a migration of air traffic to these smaller airports in the effort to mitigate traffic congestion. In addition, there will be an increase in the use of personal aircraft for pleasure and business and the emergence of on-demand air taxi services using very light jets (VLJs).

Improved access and safe operations in terminals areas and on the surface will be a requirement NAS-wide. Providing safe separation for aircraft, allowing departure and landing in lower visual conditions, will be required. Improved access to runways in a safe, fuel-efficient, and environmentally-sensitive (noise and emissions) operations across the airport environment is necessary to accommodate projected growth.

A primary NextGen objective will be to achieve the most efficient use of airspace and airports, based on actual needs, and where possible, to avoid permanent airspace and route segregation.

Operational Capability Description:

Operational Improvements will include dynamically configurable airspace (flexible airspace), development of “equivalent visual” approach procedures, low visibility taxi and departure operations, net centric weather dissemination, appropriate wake vortex procedures, and efficient and environmentally sensitive continuous approaches. A major metric of this program will be increased capacity without a corresponding increase in human resources. The ultimate goal of flexible terminals will be to provide separation capabilities that support the full use of each runway in nearly all weather conditions. This is necessary if the

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highest density airports are to meet demand. At lower demand airports, such capabilities will provide viable business cases for users as alternatives for high-density airports, as well as provide new service to communities.

A ground-based augmentation system will provide an optional lower cost alternative to ILS for CATII and CATIII-like approaches, extending operations into lower visibility conditions at many secondary airports. A ground-based augmentation system will also support higher precision approaches at major airports by providing for precision missed approaches at lower RNP. Finally, this system will enable offset landing thresholds for high-density airports, helping to implement wake-avoidance procedures on arrivals.

The goal of providing fuel-efficient, reduced emission and reduced noise precision approaches through high-density airspace to the runway is daunting. It will mean developing criteria for RNP 3D procedures with required time of arrival (RTA) objectives. These procedures will provide for energy-managed arrivals with a lower vertical containment than continuous descent arrivals (CDA) and an RTA that supports effective runway management.

Onboard displays of assigned taxi route, coupled with display of surface traffic and other hazards, will enable aircraft to safely taxi at or near normal taxi speeds in low visibility and at night. Such improvements will virtually eliminate runway incursions and other taxi errors.

Flight data management in the terminal and towers is still based on the exchange of flight strips. An improved, modern flight data management system for the terminal is critical. Currently, the ability to amend flight clearance/trajectories is limited. There is little or no insight into the status of aircraft until after they enter the airspace.